

## RECENT PAPERS BEARING ON METEOROLOGY.

MR. H. H. KIMBALL, Librarian, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a —.

*Nature. London.* Vol. 70.

— Foundation of a New Astrophysical Observatory. [Note on letter of C. Nordmann.] P. 160.

*Lockyer, William J. S.* A World-wide Barometric See-Saw. Pp. 177-178.*Solomon, Maurice.* Progress in Wireless Telegraphy. Pp. 180-181.*Langley, S. P.* Variations of Atmospheric Absorption. P. 198.*Shaw, W. N.* The Mechanics of the Atmosphere. Pp. 225-227.

— Currents around the Coasts of Newfoundland. Pp. 234-235.

*Scientific American. New York.* Vol. 91.*Byers, Charles Alma.* The Shrinkage of Great Salt Lake. P. 9.

— Registration Balloons in Italy. Pp. 61-62.

*Scientific American Supplement. New York.* Vol. 58.*Lockyer, William J. S.* A new epoch in Solar Physics. Pp. 23840-23842.*Electrical World and Engineer. New York.* Vol. 43.

— The Structure of the Atom. P. 1185.

*Electrical World and Engineer. New York.* Vol. 44.*Collins, A. Frederick.* The Rochefort System of Wireless Telegraphy. Pp. 97-99.*White, Abraham.* The Government Use of Wireless Telegraphy. Pp. 106-107.*Lewis and Clark Journal. Portland.* Vol. 2.*Hutchinson, Woods.* Oregon as a Health Resort. Pp. 8-9.*Sierra Club Bulletin. San Francisco.* Vol. 5.*McAdie, Alexander G.* Mount Whitney as a site for a Meteorological Observatory. Pp. 87-101.*Geographical Journal. London.* Vol. 24.*Scott, Robert F.* The National Antarctic Expedition. Pp. 17-30.*Nordenskiöld, Otto.* The Swedish Antarctic Expedition. Pp. 30-55.*Journal of the Manchester Geographical Society. Manchester.* Vol. 19.*Inskip, P. S.* Rhodesia. [Climate.] P. 83.*National Geographical Magazine. Washington.* Vol. 15.

— Forecasting the Weather. Pp. 283-292.

*The American Inventor. New York.* Vol. 12.

— The Aurora Borealis and Hertzian Waves. P. 296.

*Knowledge. London. New Series.* Vol. 1.*Maunder, E. Walter.* The Solar Atmosphere at Different Levels. Pp. 150-163.*Proceedings of the Royal Society. London.* Vol. 73.*Lockyer, Norman and Lockyer, Wm. J. S.* The Behavior of the Short-Period Atmospheric Pressure Variation over the Earth's Surface. Pp. 457-470.*Ramsay, William.* The Spectrum of the Radium Emanation. Pp. 470-476.*Astrophysical Journal. Chicago.* Vol. 20.*Hartmann, J.* The Correction of the Standards of Wave-Lengths. Pp. 41-48.*Mitchell, S. A.* Comet 1903 Borrelly and Light-Pressure. Pp. 63-68.*Stone, G. Johnstone.* Escape of Gases from Atmosphere. Pp. 69-78.*London, Edinburgh, and Dublin Philosophical Magazine. London.* 6 Series Vol. 7.*Morley, Edward W.* On the Vapour-pressure of Mercury at Ordinary Temperatures. Pp. 662-667.*Smoluchowski-Smolanski M.* On the Principles of Aerodynamics and their Application, by the Method of Dynamical Similarity, to some special Problems. Pp. 667-681.*Wilson, C. T. R.* The Condensation Method of Demonstrating the Ionisation of Air under Normal Conditions. Pp. 681-690.*London, Edinburgh, and Dublin Philosophical Magazine. London.* 6 series. Vol. 8.*Zahn, A. F.* Atmospheric Friction on Even Surfaces. Pp. 58-67.*Langley, S. P.* On a Possible Variation of the Solar Radiation, and its Probable Effect on Terrestrial Temperatures. Pp. 78-91.*Physical Review. Lancaster.* Vol. 19.*Reynolds, F. G.* The Viscosity Coefficient of Air, with an inquiry into the Effect of Röntgen Rays thereon. II. Pp. 37-47.

— Apparatus for Platinum Resistance Thermometry. [Abstract of paper of C. W. Waidner and H. C. Dickinson.] P. 51.

— Comparison of Standard Mercurial Thermometers. [Abstract of paper of C. W. Waidner and H. C. Dickinson.] Pp. 52-56.

*Terrestrial Magnetism and Atmospheric Electricity. Baltimore.* Vol. 9.*Elster, J. and Geitel, H.* Ueber die Radioaktivität der Erdsubstanz als eine der Ursachen des Ionengehaltes der Atmosphäre. Pp. 49-61.*Chree, C.* An inquiry into the nature of the Relationship between Sun-spot Frequency and Terrestrial Magnetism. Pp. 93-95.*American Journal of Science. New Haven.* 4th Series. Vol. 18.*Bumstead, H. A.* Atmospheric Radio-activity. Pp. 1-11.*Trowbridge, John and Rollins, William* Radium and the Electron Theory. Pp. 77-79.*Symons's Meteorological Magazine. London.* Vol. 39.*Jenkins, Arthur P.* A Three Years' Period in Rainfall. [With note by Ed. S. M. M.] Pp. 81-82.*Clark, J. Edmund.* A Danger in "Smoothing" Rainfall values. Pp. 83-84.*Russell, S. C.* Cloud Observations and Upper Atmospheric Currents. P. 85.

— South African Rainfall. Pp. 90-91.

*Aeronautical Journal. London.* Vol. 8.*Rotch, Lawrence M.* Teisserenc de Bort's Kite-Flying Experiments. [Extract.] P. 63.*Science Abstracts. London.* Vol. 7.*B[urbury], S. H.* Motion of a Solid in a Gaseous Medium. [Abstract of article of L. Jacob.] Pp. 387-388.*B[orncs], H.* Problems of the Atmosphere. [Abstract of article of J. Dewar.] Pp. 389-390.*B[orncs], H.* Hertz Rays from the Sun and Aurora Borealis. Diurnal Period of Aurora. [Abstract of articles of Nordmann.] Pp. 390-391.*B[orncs], H.* Sun-spot Variation in Latitude. [Abstract of article of W. J. S. Lockyer.] P. 392.*S[immons], W. H.* Connection between Light Radiation and Temperature. [Abstract of article of H. Eisler.] P. 405.*B[orncs], H.* Measurements of the Electric Conductivity of the Air from Balloons. [Abstract of article of H. Gerdien.] P. 453.*Annuaire de la Société Météorologique de France. Paris.* 52me année.*Brunhes, B.* Sur une expérience de Perrot. Pp. 89-91.*Besson, L.* Essai de prévision méthodique du temps. Pp. 92-97.*Marchand, E.* Étude sur les nuages dans la région des Pyrénées. Pp. 97-107.*Raulin, V.* Sur les observations pluviométriques faites dans la Transcaucasie. Pp. 129-134.*Dufour, Ch.* Sur la valeur de l'hygromètre à cheveux. Pp. 134-139.*Moureaux, Th.* Le dictum de la Saint-Médard. Pp. 139-141.*Le Temps qu'il Fait Mons. Juillet, 1904.*

— Le temps qu'il fait et les abeilles. P. 129.

*Bracke, A.* Appareils météorologiques d'amateurs. Pp. 130-134.*Archives des Sciences Physiques et Naturelles. Genève.* 4me Période. Tome 17.

— Sur les Seiches. [Review of article of F. A. Forel.] Pp. 545-547.

— Lueurs crépusculaires dans l'année 1903. P. 556.

*Ciel et Terre. Bruxelles.* 25me année.*Lockyer, N.* Simultanéité des changements solaires et terrestres. Pp. 169-178; 209-215.*Hooreman, Fern.* Le vent dans l'antiquité. Pp. 195-208.*Bulletin de la Société Belge d'Astronomie. Bruxelles.* 8me année.*Bertrand, Jean.* Le rythme des climats. Pp. 173-192.*La Nature. Paris.* 32me année.*Hamberg, Axel.* Un météorographe enregistreur sur les Alpes de Laponie suédoise. Pp. 408-410.*La Géographie. Paris.* Vol. 9.*Simmons, Hermann G.* Observations météorologiques faites dans l'archipel polaire américain par l'expédition Sverdrup. Pp. 177-187.*Angot, A.* Premiers résultats météorologiques de l'expédition antarctique écossaise de la "Scotia." Pp. 188-191.*Das Weltall. Berlin.* 21 Jahrgang.*Stentzel, Arthur.* Eine neue atmosphärische Störung. Pp. 121-125.*Nürnberg, Rudel.* Temperatur über einer Schneedecke. Pp. 131-132.

— Das neue Aeronautische Observatorium bei Lindenberg. Pp. 134-136.

*Walter, Heinrich.* Gewitter und Hagelfall. Pp. 140-141.*Assmann, J.* Wetterschiessen. P. 141-142.*Das Weltall. Berlin.* 4 Jahrgang.*Mecklenberg, Werner.* Die atmosphärische Elektrizität. Pp. 329-335.*Krebs, Wilhelm.* Atmosphärische Staubfälle und verwandte Erscheinungen. Pp. 341-342.*Walter, G.* Ein neuer Apparat zur Registrierung des Sonnenscheins. Pp. 348-349.*Geographische Zeitschrift. Leipzig.* 10 Jahrgang.

- Günther, S.** Seeschwankungen (Seiches) am Chiemsee. Pp. 279-280.
- Fischer, Karl.** Entstehung und Verlauf des Oderhochwassers im Juli 1903. Pp. 316-332.  
— Das magnetische Ungewitter vom 31. Oktober 1903. Pp. 411-416.
- Gaea. Leipzig.** 14 Jahrgang.  
— Die atmosphärische Ebbe und Flut. Pp. 437-438.
- Klein, —.** Regen und Luftdruck. [Review of paper of Less.] P. 438.
- Klein, —.** Die jetzigen täglichen Wetterprognosen und ein neues System allgemeiner Prognosen auf längere Zeit für den Atlantischen Ozean. Pp. 453-462.  
— Das Klima der Mandschurei. [Review.] Pp. 504-505.
- Annalen der Physik. Leipzig.** Vierte Folge. Band 14.  
**Clement, J. K.** Ueber die Bildung des Ozons bei hoher Temperatur. Pp. 334-353.
- Zeitschrift für Instrumentenkunde. Berlin.** 24 Jahrgang.  
**Endrös, A.** Seichesforschungen am Chiemsee. Pp. 180-181.
- Zeitschrift für Gewässerkunde. Leipzig.** 6 Band.  
**Gebauer, Curt.** Die Dresdner. [Climate.] Pp. 218-249.
- Annalen der Hydrographie und Maritimen Meteorologie. Berlin.** 32 Jahrgang.  
**Köppen, W.** Tafel zur graphischen Ableitung der Höhen aus den Meteorogrammen bei Drachenaufstiegen. Pp. 270-273.
- Rottok, —.** Ueber den Einfluss des Luftdrucks auf den Chronometergang. Pp. 287-291.
- Stach, E.** Die Anemometer-Prüfungsstation der westfälischen Berggewerkschaftskasse in der Bergschule in Bochum. Pp. 316-320.
- Illustrierte Aeronomatische Mitteilungen. Strassburg.** 8 Jahrgang.  
**Schubert, J.** Der jährliche Wärmeaustausch in der Atmosphäre und an der Erdoberfläche und die Stärke der Luft- und Dampfströmung in der Atmosphäre. Pp. 213-230.
- Physikalische Zeitschrift. Leipzig.** 5 Jahrgang.  
**Löwy, A. and Müller, Franz.** Einige Beobachtungen über das elektrische Verhalten der Atmosphäre am Meere. Pp. 290-294.
- Simpson, George C.** Ueber die Ursache des normalen atmosphärischen Potentialgefälles und der negativen Erdladung. Pp. 325-326.
- Reich, M.** Einige Beobachtungen am Schlömilch-Wellen-detektor für drahtlose Telegraphie. Pp. 338-340.
- Meteorologische Zeitschrift. Wien.** Band 21.  
**Lenard, P.** Ueber Regen. Pp. 249-262.
- Wachenheim, F. L.** Die Temperaturverhältnisse von Nordamerika. Pp. 262-273.
- Wegener, K.** Die Temperatur in 1000m. Seehöhe nach den Aufzeichnungen am Aeronautischen Observatorium des Königl. Meteorologischen Instituts bei Berlin. Pp. 273-276.  
— Temperatur der Luft über Berlin. Pp. 276-277.
- Hann, J.** Normale Temperatur in 1 km. Seehöhe über Berlin. Pp. 277-278.
- Mack, K.** Sonnenscheindauer in Hohenheim. Pp. 278-279.
- Héjas, A.** Häufigkeit der Gewitter bei verschiedenen Barometersständen in Ungarn. Pp. 280-281.  
— D. Pacini über die photoelektrische und thermische Strahlung der Sonne in Castelfranco im Sommer 1903. Pp. 281-282.
- A. Pochettino über einige photometrische Messungen. P. 282.
- C. Christoni's Pyrheliometer-Messungen zu Sestola und auf dem Monte Cimone, ausgeführt im Sommer 1900. P. 282.
- H. Alt: Sauerstoff- und Stickstoffwolken. P. 282.
- Topolansky, M.** Periodische lokale Wolkenbildungen. P. 282.
- Meusburger, —.** Kugelblitze. P. 283.  
— Resultate der meteorologischen Beobachtungen auf der Zugspitze im Jahre 1903. P. 283.
- Polis: Erdboden temperatur zu Aachen. Pp. 283-284.
- Klimatafel von Alexandrien. P. 284.
- Klimatafel von Wadi Halfa. P. 285.
- Maurer: Resultate der meteorologischen Beobachtungen in Tsingtau in dem Lustrum 1898-1903. Pp. 285-286.
- H[ann], J[ulius].** Resultate der meteorologischen Beobachtungen zu Guatimala im Jahre 1902. Pp. 286-287.
- Martin: Resultate der meteorologischen Beobachtungen von Puerto Monit in den Jahren 1888 und 1889. Pp. 287-288.
- H[ann], J[ulius.]** Meteorologische Beobachtungen an beiden Ausgängen der Magellansstrasse. Pp. 288-289.
- Siegel, Franz.** Regenbeobachtungen in Staate Paraná und Temperaturabnahme mit der Höhe. Pp. 289-292.
- Kesslitz, W.** Orkanartige Bü aus NNW., beobachtet am 4 Mai 1904 in Pola. Pp. 292-294.  
— Spektrum des Blitzes. P. 294.
- Spektrum des Nordlichtes. P. 294.

## NOTES AND EXTRACTS.

## REPRINTS.

Occasionally an author who reads his article as published in the MONTHLY WEATHER REVIEW at once writes for a few extra copies, but by the time his letter is received the whole edition of the REVIEW has been worked off, the type distributed, and the compositors are at work on the next number. In order to prevent disappointment, the contributor of an important article should request a definite number of extra copies when sending in the manuscript, if it seems to him likely that such copies will be needed.—C. A.

## TEMPERATURES IN THE UPPER ATMOSPHERE.

The note and diagrams reprinted elsewhere<sup>1</sup> from a circular issued by Prof. Dr. Richard Assmann, Director of the Aeronomical Observatory at Berlin, illustrates so clearly the nature of some of the changes going on in the atmosphere that we can not forbear calling attention to some of the lessons that may be learned from these diagrams.

Our attention is inevitably directed, first, to the fact that irregular variations in the temperature of the air are not confined to the lowest stratum and the earth's surface. The balloon ascensions from October, 1902, to December, 1903, like the less frequent ascensions of previous years, show that the temperature of the air varies largely and irregularly even up to the very highest attainable altitudes. Thus, at 4000 meters we have observed temperatures of  $-10^{\circ}$ ,  $-14^{\circ}$ ,  $-20^{\circ}$ ,  $-6^{\circ}$ ,  $-8^{\circ}$ ,  $0^{\circ}$ ,  $+4^{\circ}$  C. in rather rapid alternation, with strong indications that on other days, when no high ascensions were made, the temperatures were alternately lower and higher than these. If we take the average of all the days of the year at the earth's surface and at different altitudes, through-

out the year, we have, according to Teisserenc de Bort, an average range of about  $13^{\circ}$  C. at 4000 meters over Paris, and almost the same range at the ground and at 8000 meters. Above the latter level there appears to be a slight diminution, so that  $10^{\circ}$  C. would be a proper figure for the amplitude at 14,000 meters, but this may be only apparent and due in part to our sluggish thermometers and to the small number of observations. Professor Hann gives for the annual variation, as deduced from both the Berlin and the Paris ascensions, a maximum value of  $16.7^{\circ}$  C. at the altitude of 7000 meters, from which level it appears to diminish alike as we go upward and downward. It would therefore appear that if there be a region of the atmosphere for which the average annual range of temperature is zero, then this constant layer must be far above any altitude hitherto considered attainable by balloons. If the variation of temperature diminishes only  $2^{\circ}$  C. in ascending from 10 to 14 kilometers, then at that rate it would become  $1^{\circ}$  C. at an altitude of about 40 kilometers, so that it is somewhere in this neighborhood that we should look for the hypothetical layer of practically uniform temperature.

It has often been said that the important problems of meteorology have to do with the atmosphere at and below our highest mountains, or below 10,000 meters, but these balloon ascensions (about 600 at Paris and an even greater number in other parts of Europe), bringing us reliable information from 17,000 and even 20,000 meters, force us to broaden our views. Undoubtedly the air that descends in our areas of high pressure and that which flows out of the polar regions may come from the upper limits of the atmosphere, and with equal probability the air that ascends in our areas of low pressure may continue its journey upward to those same heights. The descent of air is characterized by the following processes, which are well illustrated in the series of 15 monthly charts, from

<sup>1</sup>The Monthly Weather Review, April, 1904, p. 177.